

Remarks

The Office Action dated December 22, 2003 has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-27 are pending in this application. Claims 1-22 stand rejected. Claims 23-27 are withdrawn from consideration.

Applicants respectfully request verification that the Examiner has considered the art included in the Information Disclosure Statement that was filed with the present application.

The rejection of Claims 1-12 under 35 U.S.C. § 112, second paragraph is respectfully traversed.

Claim 1 has been amended to recite "each said main coolant flow channel further comprising a means of controlling a flow of coolant through said main coolant flow channel so that the flow of coolant through said main coolant flow channels of said fuel assemblies located in a particular region are substantially the same, and that the coolant flow through said fuel assemblies in each said region is different from the coolant flow through said fuel assemblies in each other region". Applicants submit that the amendment to Claim 1 overcomes the cited Section 112 rejections. Accordingly, Applicants submit that Claims 1-12 are definite and particularly point out and distinctly claim the subject matter which the Applicants regard as their invention.

For the reasons set forth above, Applicants respectfully request that the Section 112 rejection of Claims 1-12 be withdrawn.

The rejection of Claims 13-17 under 35 U.S.C. § 112, second paragraph is respectfully traversed.

Claim 13 has been amended to recite "said diameter of said coolant orifices located in a particular region are substantially the same so that a flow of coolant through said main coolant flow channels of said fuel assemblies located in the particular region are substantially the same, and said diameter of said coolant orifices located in each region is different from the diameter of said coolant orifices in each other region so that the flow of coolant through said fuel assemblies in each said region is different from the flow of coolant through said fuel assemblies in each other region". Applicants submit that the amendment to Claim 13 overcomes the cited Section 112 rejections. Accordingly, Applicants submit that Claims 13-17 are definite and particularly point out and distinctly claim the subject matter which the Applicants regard as their invention.

For the reasons set forth above, Applicants respectfully request that the Section 112 rejection of Claims 13-17 be withdrawn.

The rejection of Claims 1-22 under 35 U.S.C. § 102(b) as being anticipated by Patterson (US 3,892,625) is respectfully traversed.

Applicants respectfully submit that the Section 102 rejection of the presently pending claims is not a proper rejection. The Federal Circuit has opined that to anticipate a claim, a single source must contain all of the elements of the claim. See *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 137, 1379, 231 U.S.P.Q. 81, 90 (Fed. Cir. 1986). Also, missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of another reference. See *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984).

Particularly, Claim 1 of the present application recites a nuclear reactor core that includes: a plurality of fuel assemblies with each fuel assembly comprising a lower tie plate and

a main coolant flow channel having an inlet. The plurality of fuel assemblies are arranged into at least three regions within the core, and each main coolant flow channel further includes a means of controlling a flow of coolant through the main coolant flow channel so that the flow of coolant through the main coolant flow channels of the fuel assemblies located in a particular region are substantially the same, and that the coolant flow through the fuel assemblies in each region is different from the coolant flow through the fuel assemblies in each other region.

Patterson does not describe nor suggest a nuclear reactor core as recited in Claim 1. Particularly, Patterson does not describe nor suggest that the plurality of fuel assemblies are arranged into at least three regions within the core. Rather, Patterson describes that the fuel assemblies are arranged into two regions in the core. Specifically, at Col. 3, lines 20-25, Patterson, referring to Figure 1, describes that "In the region located outside line A are the restraint assemblies 18 and reflector assemblies, whereas in the region located between lines A and B are located the radial blanket fuel assemblies or breeder assemblies, and in the region inside line B are located the fuel assemblies". Applicants submit that restraint assemblies 18 are not fuel assemblies.

Further, Patterson does not describe nor suggest that each main coolant flow channel further includes a means of controlling a flow of coolant through the main coolant flow channel so that the flow of coolant through the main coolant flow channels of the fuel assemblies located in a particular region are substantially the same, and that the coolant flow through the fuel assemblies in each region is different from the coolant flow through the fuel assemblies in each other region. Rather, Patterson describes that flow of coolant through several blanket fuel assemblies are controlled by one restraint assembly, see Figure 2. The main coolant flow

channel of each blanket fuel assembly does not include a means of controlling the coolant flow through the channel.

For the reasons set forth above, Applicants submit that Claim 1 is patentable over Patterson.

Claims 2-12 depend from independent Claim 1. When the recitations of dependent Claims 2-12 are considered in combination with the recitations of Claim 1, Applicants respectfully submit that Claims 2-12 likewise are patentable over Patterson.

Claim 13 recites a nuclear reactor core that includes a plurality of fuel assemblies, with each fuel assembly including a lower tie plate and a main coolant flow channel having an inlet, and a plurality of coolant orifices with each coolant orifice including a diameter and located in an inlet of a cooling flow channel. The plurality of fuel assemblies are arranged into at least three regions within the core. The diameter of the coolant orifices located in a particular region are substantially the same so that a flow of coolant through the main coolant flow channels of the fuel assemblies located in the particular region are substantially the same, and the diameter of the coolant orifices located in each region is different from the diameter of the coolant orifices in each other region so that the flow of coolant through the fuel assemblies in each said region is different from the flow of coolant through the fuel assemblies in each other region.

Patterson does not describe nor suggest a nuclear reactor core as recited in Claim 13. Particularly, Patterson does not describe nor suggest that the plurality of fuel assemblies are arranged into at least three regions within the core. Rather, as explained above, Patterson describes that the fuel assemblies are arranged into two regions in the core. Also, Patterson does not describe nor suggest a plurality of coolant orifices located in the inlet of the main coolant

flow channel of the fuel assemblies. Rather, Patterson describes orifice plates 31 located in the main flow channel of restraint assemblies 18. Further, Patterson does not describe not suggest that the diameter of the coolant orifices located in a particular region are substantially the same so that a flow of coolant through the main coolant flow channels of the fuel assemblies located in the particular region are substantially the same, and the diameter of the coolant orifices located in each region is different from the diameter of the coolant orifices in each other region so that the flow of coolant through the fuel assemblies in each said region is different from the flow of coolant through the fuel assemblies in each other region.

For the reasons set forth above, Applicants submit that Claim 13 is patentable over Patterson.

Claims 14-17 depend from independent Claim 13. When the recitations of dependent Claims 14-17 are considered in combination with the recitations of Claim 13, Applicants respectfully submit that Claims 14-17 likewise are patentable over Patterson.

Claim 18 recites a nuclear reactor core that includes a plurality of fuel assemblies, with each fuel assembly including a lower tie plate and a main coolant flow channel having an inlet an inlet; and at least one of a plurality of coolant orifices and a plurality of flow restriction devices. Each coolant orifice includes a diameter and is located in an inlet of a cooling flow channel. Each restriction device is detachably coupled to a lower end of the lower tie plate and includes a plurality of flow openings, with each flow opening having a diameter. The plurality of fuel assemblies are arranged into at least three regions within the core. The diameter of the coolant orifices located in a particular region are substantially the same, and the diameter of the coolant orifices of each region is different from the diameter of the coolant orifices in each other region.

The flow restriction devices located in a particular region are sized so that a number of flow openings are the same, and the number of flow openings of the flow restriction devices of each region is different from the number of flow openings of the flow restriction devices of each other region.

Patterson does not describe nor suggest a nuclear reactor core as recited in Claim 18. Particularly, Patterson does not describe nor suggest that the plurality of fuel assemblies are arranged into at least three regions within the core. Rather, as explained above, Patterson describes that the fuel assemblies are arranged into two regions in the core. Also, Patterson does not describe nor suggest a plurality of coolant orifices located in the inlet of the main coolant flow channel of the fuel assemblies. Rather, Patterson describes orifice plates 31 located in the main flow channel of restraint assemblies 18. Further, Patterson does not describe not suggest that the diameter of the coolant orifices located in a particular region are substantially the same so that a flow of coolant through the main coolant flow channels of the fuel assemblies located in the particular region are substantially the same, and the diameter of the coolant orifices located in each region is different from the diameter of the coolant orifices in each other region so that the flow of coolant through the fuel assemblies in each said region is different from the flow of coolant through the fuel assemblies in each other region. In addition, Patterson does not describe not suggest a plurality of flow restriction devices detachably coupled to a lower end of the lower tie plate and including a plurality of flow openings. Further, Patterson does not describe nor suggest that the flow restriction devices located in a particular region are sized so that a number of flow openings are the same, and the number of flow openings of the flow restriction devices

of each region is different from the number of flow openings of the flow restriction devices of each other region. The fuel assemblies of Patterson do not contain flow restriction devices.

For the reasons set forth above, Applicants submit that Claim 18 is patentable over Patterson.

Claims 19-22 depend from independent Claim 18. When the recitations of dependent Claims 19-22 are considered in combination with the recitations of Claim 18, Applicants respectfully submit that Claims 19-22 likewise are patentable over Patterson.

For the reasons set forth above, Applicants respectfully request that the Section 102(b) rejection of Claims 1-22 be withdrawn.

The rejection of Claims 1, 2, 13, and 18 under 35 U.S.C. § 102(b) as being anticipated by Baxi (US 4,303,474) is respectfully traversed.

Applicants respectfully submit that the Section 102 rejection of the presently pending claims is not a proper rejection. The Federal Circuit has opined that to anticipate a claim, a single source must contain all of the elements of the claim. See *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 137, 1379, 231 U.S.P.Q. 81, 90 (Fed. Cir. 1986). Also, missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of another reference. See *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984).

Baxi does not describe nor suggest a nuclear reactor core as recited in Claim 1. Particularly, Baxi does not describe nor suggest that the plurality of fuel assemblies are arranged into at least three regions within the core. Rather, Baxi describes that the fuel assemblies are arranged into two regions in the core, a region of blanket elements and a region of fuel elements.

Specifically, at Col. 3, lines 9-15, Baxi , referring to Figure 1, describes that the core includes a plurality of fuel elements and a plurality of blanket elements. "The blanket elements are arranged in three rows around the fuel elements, and the core assembly assumes a hexagonal shape". Also, Baxi does not describe nor suggest that that each main coolant flow channel further includes a means of controlling a flow of coolant through the main coolant flow channel so that the flow of coolant through the main coolant flow channels of the fuel assemblies located in a particular region are substantially the same, and that the coolant flow through the fuel assemblies in each region is different from the coolant flow through the fuel assemblies in each other region. Rather, Baxi describes that the blanket elements include a flow restrictor device in the main coolant conduit. However, Baxi does not describe nor suggest that the main coolant conduit of the fuel elements include a means of controlling the flow through the conduit.

For the reasons set forth above, Applicants submit that Claim 1 is patentable over Baxi.

Claim 2 depends from independent Claim 1. When the recitations of dependent Claim 2 are considered in combination with the recitations of Claim 1, Applicants respectfully submit that Claim 2 likewise is patentable over Baxi.

Baxi does not describe nor suggest a nuclear reactor core as recited in Claim 13. Particularly, Baxi does not describe nor suggest that the plurality of fuel assemblies are arranged into at least three regions within the core. Rather, as explained above, Baxi describes that the fuel assemblies are arranged into two regions in the core. Also, Patterson does not describe nor suggest a plurality of coolant orifices located in the inlet of the main coolant flow channel of the fuel assemblies. Rather, Baxi describes a restrictor assembly located in the blanket elements and not the fuel elements. Further, Baxi does not describe not suggest that the diameter of the

coolant orifices located in a particular region are substantially the same so that a flow of coolant through the main coolant flow channels of the fuel assemblies located in the particular region are substantially the same, and the diameter of the coolant orifices located in each region is different from the diameter of the coolant orifices in each other region so that the flow of coolant through the fuel assemblies in each said region is different from the flow of coolant through the fuel assemblies in each other region. The restrictor assembly does not include an orifice, but rather a plurality of roughened rods.

For the reasons set forth above, Applicants submit that Claim 13 is patentable over Baxi.

Baxi does not describe nor suggest a nuclear reactor core as recited in Claim 18.

Particularly, Baxi does not describe nor suggest that the plurality of fuel assemblies are arranged into at least three regions within the core. Rather, as explained above, Baxi describes that the fuel assemblies are arranged into two regions in the core. Also, Baxi does not describe nor suggest a plurality of coolant orifices located in the inlet of the main coolant flow channel of the fuel assemblies. Rather, Baxi describes a restrictor assembly located in the blanket elements and not the fuel elements. Further, Baxi does not describe nor suggest that the diameter of the coolant orifices located in a particular region are substantially the same so that a flow of coolant through the main coolant flow channels of the fuel assemblies located in the particular region are substantially the same, and the diameter of the coolant orifices located in each region is different from the diameter of the coolant orifices in each other region so that the flow of coolant through the fuel assemblies in each said region is different from the flow of coolant through the fuel assemblies in each other region. In addition, Baxi does not describe nor suggest a plurality of flow restriction devices detachably coupled to a lower end of the lower tie plate and including a

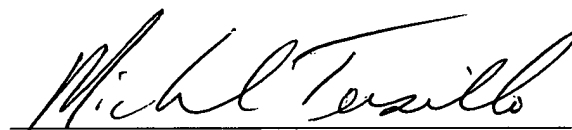
plurality of flow openings. Baxi does not describe nor suggest that the flow restriction devices located in a particular region are sized so that a number of flow openings are the same, and the number of flow openings of the flow restriction devices of each region is different from the number of flow openings of the flow restriction devices of each other region. Rather, Baxi describes restrictor devices that are only located in the blanket elements and not the fuel elements. Further, the Baxi restrictor device does not include a plurality of fuel openings, but rather a plurality of roughened rods.

For the reasons set forth above, Applicants submit that Claim 18 is patentable over Baxi.

For the reasons set forth above, Applicants respectfully request that the Section 102(b) rejection of Claims 1, 2, 13, and 18 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Favorable action is respectfully solicited.

Respectfully submitted,

A handwritten signature in black ink, reading "Michael Tersillo", written over a horizontal line.

Michael Tersillo
Registration No. 42,180
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070